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Art. I.—REPORT OF EXPERIMENTS ON THE ACTION OF THE HEART, &c.

BY C. W. PENNOCK, M. D., AND E. M. MOORE, M. D.

(Continued from page 269.)

Experiment 9th.—Experiencing great difficulty in analysing some of the movements and sounds of the heart in animals of the size upon which we had experimented, we resolved to inspect the heart of a horse, in which the pulse in health ranges from thirty to forty per minute. In this experiment we were assisted by Drs. Gerhard, Stewardson, Peace, Hardy, Fell, and Goddard, but to the latter gentleman especially we owe our thanks for the assistance rendered.

We found in the animal we had selected that the pulse was about thirty-six per minute, and respiration twenty-eight in the same time.

In order to prolong life, the trachea was opened before the blow was given. Immediately after the blow was struck, which was directed to the forehead, that the skull might be depressed upon the anterior lobes of the brain, the bellows-tube was introduced, and artificial respiration commenced. The skin was dissected back from the median line upon the thorax, the cartilages of the ribs sawn through upon the left side of the sternum, and several of the ribs cut off about one third of their whole length from their sternal extremity. On account of the hemorrhage, we were obliged to secure many arteries, and twenty-five minutes had elapsed from the time the blow was given until the heart was exposed. It presented the left ventricle, the appendix of the left auricle, and a portion of the right ventricle. The pulsations were one hundred per minute, but on account of its size we were enabled to observe the relative contraction of the auricle and ventricle, which we found to succeed each other as follows:—During the contraction of the ventricle the auricle dilates; at the expiration of the systole, the auricle contracts, and the diastole of the ventricle commences, the auricular contraction apparently occupying about one half the time of the ventricular diastole. During its systole, the left ventricle flattens and elongates. During its diastole it shortens, and assumes a rounded form. The sounds were detected, but not loud; the second not existing over the pulmonary artery, but heard over the body of the left ventricle.

Death arrested the further progress of the experiment, twenty minutes after the chest was opened. Dr. Moore coincides with the other gentlemen in reference to the relative contraction of the auricle and ventricle, and thinks his observation, in experiment 1st, erroneous.

Although every experiment had confirmed our views of the agency of the valves of the aorta in the production of the second sound, we had heretofore failed in elevating them; we were also still doubtful respecting the relative

contraction of the auricle and ventricle, for, although the last experiment had appeared more satisfactory on this point than several of the preceding, yet, as life continued but a short time after opening the thorax, and as many circumstances unfavourable to clear and calm observation were connected with the experiment, we resolved to pursue the investigation of these obscure points, and to exhibit the facts that we had observed to a few medical friends.

Experiment 10*th.*—Present Drs. Gerhard, Goddard, Stewardson, Peace, Hardy, Pennock, and Moore. A ram, about six months old. Pulse, 96. Deprived of sensation by a blow upon the head, and opened as in experiment 1st. The heart contracted well, but exhibited great irritability when touched. Its pulsations rose to one hundred and fifty per minute, rendering it difficult to analyse the sounds; but the first sound and impulse was observed to coincide. The spiral motion and elongation were as heretofore detailed. While still contracting forcibly, the heart was removed from the body, and the first sound heard when entire, and also when both ventricles were cut open and emptied of blood.

Experiment 11*th.*—As the last experiment had not been very satisfactory, the same gentlemen being present, we pursued the investigation upon a calf, four weeks old. Pulse, 105. Both sounds distinctly heard through the chest. Struck upon the anterior portion of the cranium, and opened as before. The pericardium was left entire, to avoid the irritation of immediate contact with the heart. The stethoscope was placed alternately upon the aorta, the body of the right ventricle, and upon the septum, near the apex. Upon the aorta the second sound was found to predominate; upon the body of the right ventricle it was scarcely heard, and the first was present; and near the apex upon left ventricle, or septum, both were detected; the first, louder. The spiral motion, the elongation, and elevation of the apex as before observed. A hook was passed into the aorta by Dr. Moore, and one of the semilunar valves elevated; the eyes of the auscultator were closed, to prevent the possibility of bias from preconceived opinions. While in this position, the auscultator announced the absence of the second sound, and the accession of a rough bellows sound in the first sound. The hook was then withdrawn, and the second sound was declared to have returned. This experiment was tried twice by each, and by some three times in succession, and the results were uniform. No hook was passed into the pulmonary artery, inasmuch as no sound was heard over it at this time. The auricle contracted while in the hand, emptied of blood.

Experiment 12*th.*—A ram, six months old. Present Drs. Stillé, Hardy, Pennock, and Moore. Pulse, 96; respiration, 56. Animal struck upon forehead, as in the previous experiments, and artificial respiration established in three-fourths of a minute. During the opening of the chest much hemorrhage took place. The heart was at first tumultuous in its action, but became regular in a few minutes. The first and second sound were heard over the body of the right ventricle, but more feebly than over the left; both sounds were heard over the left ventricle and aorta, but the second louder than the first over the latter than over the former. Hooks were passed into the ventricle, for the purpose of keeping open the auriculo-ventricular valves. (These, however, failed of effecting the object, as seen upon examination afterwards.) The sounds gradually became more feeble as the heart congested, and the second sound ceased altogether, both over the heart and arteries, while the first still remained. The auricle was observed to contract over its entire surface, as much upon the body as upon the appendix. The contractions with reference to the ventricles were irregular at this time, except for a very short period, when they appeared to precede those of the ventricle immediately, recurring at the termination of repose. The heart contracted one hour after the blow was given.

Experiment 13th.—Wether, nine months old. This experiment failed on account of defect in the apparatus for maintaining respiration. As the

heart became more feeble, the auricle appeared to contract immediately antecedent to the systole of the ventricle, but owing to the circumstances attendant upon this experiment, we feel very uncertain as regards the observation.

Experiment 14*th.*—Ewe, nine months old. Struck as before. Trachea opened in half a minute. Chest opened in four minutes. Heart tumultuous. It gradually became more quiet, until it fell to 120, and contracted forcibly. The first sound alone was heard over the right ventricle and pulmonary artery. Pressure upon this artery produced a bellows sound in the first sound. The auricles were pushed into the auriculo-ventricular openings by the fingers. The first sound was thus rendered much more feeble, and lost its sharp character; the ventricles contracting imperfectly and irregularly.

Experiment 15*th.*—A calf, five days old; pulse, 126; respiration, 30. Sensation destroyed by a blow upon the head, as before. Artificial respiration established in two minutes and a half. The heart was exposed in six minutes, rather hurried in its action, but soon fell to one hundred and twenty pulsations per minute. The heart contracted with a moderate force. The second sound extremely feeble over the body of the right ventricle and pulmonary artery; but it soon disappeared over both. The sound was still heard over the left ventricle and aorta, louder over the latter. The auricle contracted with a quick motion, the contraction not being confined to the appendix, but extending over the whole body of the organ. As the heart became weaker, the pulsations were slower, and we were enabled to analyse the relative contractions of the auricle and ventricle much better than at any previous experiment. They evidently bore a different relation from what we had previously supposed. The succession is as follows:—First the auricle contracts and the action is immediately propagated to the ventricle, which contracts, instantly, accompanied with the diastole of the auricle; the diastole of the ventricle immediately follows, accompanied with a subsidence of the auricle by passive and not active contraction, which partially fills the ventricle; then follows the state of repose, at the termination of which, the auricle contracts. During the dilatation of the auricle, the vena cava also dilates, but it was difficult to say, whether the cava dilated during the contraction of the auricle or not, as the contraction of the latter was so rapid and so soon followed by the contraction of the ventricle. While still contracting, and when scarcely any sound was heard upon the ventricles, the stethoscope was applied to each auricle, and a sound similar to the first was heard, but very short, and more flapping, resembling very nearly the first sound of the fœtal heart.

Experiment 16*th.*—A calf, two months old. Pulse, 90. Deprived of sensation as before. The chest was opened in eight minutes, and a few ribs removed from the left side. The heart pulsated slowly, and at a rate of 95 per minute; both sounds were distinct, but not loud. The second sound was heard more loudly over the pulmonary artery than on the right ventricle, the sound being but feeble in either position. Both sounds were heard upon the left ventricle. An instrument was introduced into the left ventricle, through the auricle, and the mitral valves prevented from collapsing; this produced congestion of the ventricle immediately, and the action became hurried and irregular. The stethoscope being applied to the left ventricle, the sound was not as loud and clear as before, but not modified in any other manner. The instrument was then withdrawn, and the sound became louder. The relative contractions of the auricles and ventricles were as in the last experiment.

The difference in the intensity of the first sound in this experiment, when the mitral valve was kept open and when allowed to close, may be attributed to the fact that there was no fixed point for the muscle of the ventricle to act upon, by the retention of the blood, and it therefore could not empty itself of its contents, and, of course, would not yield a strong sound.

From the preceding experiments we draw the following conclusions:—

1st. The impulse is synchronous with, and caused by, the ventricular contraction,—and when felt externally, arises from the striking of the apex of the heart against the thorax.

2d. The expulsion of the blood from the ventricles is effected by an approximation of the sides of the heart only, and not by a contraction of the apex towards the base; during the systole the heart performs a spiral movement, and becomes elongated. (Experiments 6th, 10th, and 11th.)

3d. The ventricle contracts and the auricle dilates at the same time, occupying about one half of the whole time required for contraction, diastole, and repose. Immediately at the termination of the systole of the ventricle, its diastole succeeds, occupying about one fourth of the whole time, synchronous with which the auricle diminishes, by emptying a portion of its blood in the ventricle, unaccompanied with muscular contraction. The remaining fourth is devoted to the repose of the ventricles, near the termination of which the auricle contracts actively, with a short, quick motion, thus distending the ventricles with an additional quantity of blood; this motion is propagated immediately to the ventricles, and their systole takes place, rendering their contractions almost continuous. (Experiments 15 and 16.)

4th. From the termination of their diastole to the commencement of their systole, the ventricles are in a state of perfect repose, their cavities remaining full, but not distended, while those of the auricles are partially so, during the whole time.

5th. The sounds are produced by the motions of the heart or its contents, and not by striking against the thorax, as proved in all the experiments; being much louder when the stethoscope was applied directly to the heart, than when to the chest, or with the lungs interposed.

6th. The sounds are more distinct when the muscle is thin, and contracts quickly. Hence the clear, flapping character of the first sound over the right ventricle, as compared with the left.

7th. The first sound, the impulse, and the ventricular systole are synchronous. This sound may be a combination of that caused by the contraction of the auricles, the flapping of the auriculo-ventricular valves, the rush of blood from the ventricles, and the sound of muscular contraction. From experiments 3d, 4th, 6th, and 10th, when the heart was removed from the body, the ventricles cut open and emptied of their contents, the auriculo-ventricular valves elevated, and a sound, resembling the first, still heard, it may be chiefly attributed to the muscular contraction. That these valves aid but slightly in its production, may also be inferred from experiment 16.

8th. The second sound is caused exclusively by the closure of the semilunar valves from the reaction of the arterial columns of blood upon them, in its tendency to regurgitate through the aortic and pulmonary orifices. This is proved by the greater intensity of this sound over the aorta than elsewhere, the blood having a strong tendency to return through the valvular opening; by the greater feebleness of the sound over the pulmonary artery, which is short, and soon distributes its blood through the lungs, thus producing but slight impulse upon the valves in the attempt to regurgitate; by the disappearance of the sound, when the heart becomes congested and contracts feebly; and, finally, on account of its entire extinction when the valve of the aorta was elevated.

9th. The second sound is synchronous with the diastole of the ventricle.

From these experiments, it will be seen that our conclusions coincide very nearly with those of the British physiologists,—the correctness of whose results, when compared with those of the French, may be mainly attributed to the use of larger animals. From our observations, calves, of from four to eight weeks old, are decidedly preferable to other quadrupeds for these investigations. The tenacity of life of calves of this age is greater than in older animals, whilst the cardiac pulsations are slower, and more

forcible than they are in the younger. The heart of this animal, too, is of large size, and the introduction of hooks for the elevation of the valves is readily effected.

The English and Irish physiologists enjoyed greater facilities in the slow and regular action of the heart, as induced by the woorara. Perhaps, at some future period, when this may be obtained, the investigations may be pursued, as other points of enquiry are offered.

C. W. Pennock,
E. M. Moore.

Philadelphia, Nov. 2, 1839.

For the American Medical Intelligencer.

Art. II.—CASE OF DEATH FROM THE ACCIDENTAL ADMINISTRATION OF OPIUM, WITH AN ACCOUNT OF THE DISSECTION.

BY W. J. DUFFEE, M. D., OF MOYAMENSING.

The difficulty, which often arises from our want of accurate knowledge of the morbid appearances on dissection of those who die from the effects of narcotic poisons, has led me to publish this case—which, brief as it is, I hope may further the object I have in view.

On the 13th September, 1839, I was requested, by James Gregory, Coroner, to examine for him the body of Mary Ann Krumbar, æt. 3 years, who had suddenly expired at Fairmount. I did so in the presence of his jury, and of Drs. Emanuel and Foster.

Appearances twenty-four hours after death.—No signs of putrefaction; body fat and muscular. Pupils very much dilated; superficial veins of the back and neck filled with dark-coloured blood.

The thorax being opened, the right lung was found to be distended and filling up that side of the chest; the left moderately so; and, in the upper lobe of the latter, there was a number of black spots, varying in size from a shilling to a half dollar.

Both lungs were congested, and crepitated to the touch; and, when cut into, blood escaped freely.

The right auricle of the heart, the aorta and pulmonary veins were filled with very dark fluid blood.

Abdomen.—Moderately distended; ileum slightly inflamed; from which we inferred, that a diarrhœa had existed for a short time before death. Stomach contained a good deal of farinaceous matter, and smelt faintly of opium.

Brain.—Vessels throughout were very much engorged; the medullary portion presented innumerable black spots. Ventricles contained about one dram of serum.

The inference drawn from the appearances was, that the child died from the effects of opium.

It appeared from the evidence before the jury, that the child had laboured for two or three days under a trifling bowel complaint, and that some friend had advised the mother to administer paregoric.

On going to a drug store she obtained from the person in attendance what she thought to be paregoric, of which she gave half a teaspoonful; when the little patient fell into a sleep, which was fatal in three hours' time.

The coroner, from the nature of the verdict, arrested the vender of the drug, who persisted in declaring that what he had sold was paregoric; but, at length, finding himself rather awkwardly situated, said he was sorry, and commenced shedding tears—that he was wrong in denying that it was laudanum he had sold, but that it was unintentionally done, as bottles of pare-

goric and laudanum stood one over the other on the shelves, and that he did not ascertain his mistake until after the person had left the shop, and as he did not know where she lived he could not go after her, or he otherwise would have done so; also, that as death had taken place he had feared to acknowledge his blunder, lest he should be prosecuted. He was accordingly taken before Mayor Roach, before whom he obtained a private hearing. It being proved, that no malice existed, but that all took place by accident, and the parents urging their entire satisfaction as to his innocence, he was discharged with a few remarks from his honour.

W. J. Duffee.

Nov. 10, 1839.

For the American Medical Intelligencer.

Art. III.—PHILADELPHIA HOSPITAL.

DR. DUNGLISON, ATTENDING PHYSICIAN.

Case of Purpura Hæmorrhagica. Reported by William H. McKee,—at the time, Resident Physician.

Mary Ann K., aged 31; born in Ireland; single; habits temperate; has been an inmate of the Almshouse for one year—most of which time she has passed in the women's medical wards, lunatic asylum, and out wards. At the time of her first entrance, she was labouring under dysentery, which was soon cured. From the melancholia, which existed at the time of her entrance, continuing and evidently depending upon some religious hallucinations, she was transferred to the Woman's Lunatic Asylum, where she remained for some time, and was then discharged to the out wards. She is a catholic by birth, and belongs to the holy order. The greater portion of her time is spent in kneeling to the cross and counting a string of beads. It is difficult to get her to answer any interrogation as respects her anterior history, previous to entering the hospital, with the exception that she says she had not eaten a mouthful of animal food for better than three years.

May 25th. *Present state.*—She is of medium stature; has sandy hair; eyes of a hazel colour; very much emaciated, and evidently olygæmic; skin of a sallow appearance, cool and dry; pulse 90, small and soft; respiration 20; cephalalgia moderate; intelligence dull; tongue much larger than ordinary, and appears to be swollen, coated white; papillæ project beyond their normal size; gums soft and spongy, of a faint red colour, with a slight exudation of blood through the epithelium; breath very offensive; tenderness upon pressure in epigastrio and in right and left hypochondria; abdomen hard, and tender along the course of the colon; bowels constipated; urine scanty, though highly coloured; decubitus on left side and flexed; the feet and legs covered with purple spots and petechiæ from the size of a pin's head to that of the palm of the hand, but very few on any other part of the body. The left leg is largest and contains most of the vibices; both are quite tender to the touch.

℞. Magnes. ust. ʒi.; pulv. carb. lig. ʒii.; pulv. zing. grs. x. to be taken at once, and to be followed by a common enema in six hours afterwards.

26th.—Bowels opened three times; fæces of a black colour and very offensive. Says that she is weak. She was then put upon the following articles: ℞. Quassiæ ℥ss; rad. rhei. cont. ʒii.; sodæ bicarb. ʒii.; aqua bullient. Oi.; infuse for an hour and strain. Of this she was to take two ounces three times a day. Also, ten drops of the liq. ferri hydriodatis, three times a day, in conjunction with as good and nutritious a diet as she would take.

28th.—Bowels opened three times in forty-eight hours; stools as before; the exudation of blood from the mouth and gums has increased; pulse 95, small

and soft; skin cool; petechiæ rather increased; decubitus still on left side and flexed. Ordered tinct. creosot. ℥i.; aquæ, ℥vi. to gargle mouth, and a bottle of porter. She rejects all animal food, and will not eat any thing but arrow-root and milk, believing it to be a sin. A priest has since seen her, and tried to convince her of the false opinion which she had taken up. But so long has she persisted in this course, that she would not yield to his persuasions.

Treatment continued.

30th.—Says that she feels better. Bowels opened once; stools still black and offensive; hemorrhage from gums and mouth nearly ceased.

31st.—Infusion of quassia, &c. discontinued. Ordered quin. sulph. gr. i. four times a day.

June 1st.—Slept well: mouth and gums nearly healed; bowels disposed to be constipated; pulse 65, small and compressible. Ordered rhubarb and magnesia, to be followed by an enema. Bowels have been opened three times; stools continue black and offensive.

2d.—Skin warm; pulse 95, small and soft; mouth better. Appears more desponding, and still continues to hold the cross before her and to count the beads; she will not allow her finger or toe-nails to be cut, which are from a fourth to half an inch in length. Refuses to take animal food. Petechiæ as before.

4th.—Was ordered castor oil, ℥i., on the 3d, which operated twice; stools as before; mouth and gums appear quite well. Has eaten four eggs in addition to the milk and arrow-root. Looks better; skin rather cool; pulse 90, small and soft. Treatment to be continued, and to have six ounces of wine, and eggs, for diet.

9th.—Intelligence dull; answers questions reluctantly and indistinctly. Bowels have been regular until within a few days; at first constipated. Complains of pain in right hypochondrium. Ordered pil. cath. comp. iii. and to continue treatment.

10th—Bowels opened four times; stools large and continue black and offensive. Says that she feels better. Will not take animal food, but eats freely of eggs and arrow-root. The quinine was now discontinued, and the acid. sulph. arom. gtt. x., three times a day, substituted. Her treatment now consists in the liq. fer. hydriod. and the aromatic sulph. acid, in conjunction with as full and nutritious a diet as she will take.

12th.[1]—The compound cathartic pills were sent up again into the ward, and administered by the nurse without the knowledge of the physician. An enema was administered on last evening, which moved the bowels three times very freely. Stools now became rather green and not so offensive. Skin cool; pulse 100, and extremely feeble; respiration rather stertorous; mouth very much swollen, and a profuse discharge of saliva. She was salivated from the use of the second dose of the pills accidentally administered. Petechiæ somewhat diminished.

15th.—The former treatment has been continued, with the exception of the gargle of creosote, which has been added for the treatment of the ptyalism. Bowels were opened last evening by means of an enema; stools a little darker than last, and more offensive; pulse 90, and small; ptyalism very profuse; petechiæ have nearly all disappeared; skin cool; appetite bad. Continue treatment.

18th.—Bowels are opened every third day by an enema; stools more natural and less offensive; petechiæ as before; ptyalism decreasing; skin improved in appearance, though cool; sleeps well. Her diet is of eggs and arrow-root. Continue treatment.

[1] At this time a change of wards in the institution occurred among the resident physicians. By the kindness of my friend, Dr. Wm. J. Webb, from Alabama, who succeeded me as senior resident physician, I was allowed the privilege of watching the case and noting the changes that took place throughout the duration of the disease.

She has continued to take the medicines prescribed as above during the greater portion of the time. Very little else was prescribed, with the exception of a change of gargles for the mouth. The salivation continued very profuse for three weeks. As this declined, her appetite began to improve; yet her bowels remained constipated, and had to be opened every third day by an enema. During the existence of the ptyalism, the petechiæ nearly disappeared, though the tenderness to the touch was equally as great.

Through the influence of the priest, she consented to have her nails cut. Her diet chiefly consisted of eggs, oatmeal gruel, arrow-root, &c. As the symptoms of the ptyalism declined, the petechiæ returned. The treatment was still persisted in, and as a further decline followed, and the tonic influence of the remedies were more decided, her appetite also increased. She asked if a salt herring would be allowed her, which was promptly complied with. This she seemed to relish very much, and continued to eat daily for some time, with tea or coffee for breakfast and supper.

After the full convalescence from the salivation, the petechiæ again began to decline. There were none to be found at any time upon any part of the body, except the legs and lower part of the abdomen; those on the abdomen soon disappearing. During the whole of the salivation the hemorrhage from the mouth and gums was very slight. From the softness and spongy condition of the gums, and the predisposition to hemorrhage, of course much danger was to be apprehended, though it happily terminated without any serious consequences. As her general health improved, she was at last prevailed upon to take mutton for dinner. From the time she commenced the animal food the change of convalescence was daily evident, and continued on so rapidly that she was discharged cured on the 1st of September, making the duration of the disease, from the time she entered the hospital, about fourteen weeks.

Remarks.—The pathology of this disease is involved in obscurity, as cases are met with that do not agree with the pathological solutions that have been presented. For the present acceptation of the term "purpura," the profession is indebted to Willan;[1] it was ranked by him under the order exanthemata.

"The term purpura, purpura hemorrhagica, and hemorrhœa petechialis, was formerly distinguished in medical writings by the designation of morbis maculosus hemorrhagicus, petechia sine febre, phœnigmus petechialis."[2] Petechia[3] is a symptom which has long been known in continued fevers, and other febrile diseases in which they have been supposed to indicate peculiar malignancy, as a name introduced into nosological language from their resemblance to flea-bites.

Purpura hemorrhagica is a much more formidable disease than any other variety. Considered as a hemorrhagic affection, it is a most interesting subject of pathological enquiry. It is characterised by nearly the same external appearance as purpura simplex. The hemorrhages are often very profuse, and sometimes there is a slow and almost incessant oozing of blood. The bleeding may occur from any part of the body, but it generally occurs from the gums, nostrils, throat, tongue, lips, and inside of the cheeks, and the lining membrane of the eyelids, the external ear, and urethra; also, from the lungs, stomach, bowels, uterus, kidneys, and bladder.

The predisposing and exciting causes of purpura have long been a subject of controversy; some contending that it is closely allied to scorbutus, others that it has no connection and is a separate and distinct affection. "In Dr. Blackall's work on Dropsy, several cases are related resembling land scurvy, two of which at least, are clearly cases of purpura. In both of these the urine was albuminous, and he states as his opinion that venesection would

[1] Willan on Cutaneous Diseases. Bateman's Synopsis, 3d edition.
[2] Bateman's Synopsis, 3d edition, and Cyclopædia of Practice of Medicine.
[3] Cyclopædia, &c. article Fever, and Plumbe on Diseases of the Skin.

have been the appropriate remedy in the early stage, and perhaps a successful cure."

The urine was tested several times in the case reported above, and no coagulum by heat, nor albuminous precipitate formed with nitric acid. But in a case of purpura simplex, that occurred in a private part of the institution, which came under my care, there was a very large albuminous deposit. Venesection had been employed in the commencement of the disease, with evident constitutional disturbance. The patient soon recovered, from the use of mild purgatives, followed by tonics and chalybeates, in conjunction with a nutritious diet.

It is pretty well agreed by writers[1] that purpura chiefly occurs in individuals of delicate habit, or enfeebled by their occupation or mode of life.

Professor Dunglison, in his clinical observations on this case, ascribed it to the patient having restricted herself to one sort of food—vegetable—after having been accustomed to both animal and vegetable; and he laid down the position, that if an animal—omnivorous by habit—be confined to either animal or vegetable diet, his nutrition will fall off, and he will become scorbutic or purpuric. He referred to cases of disease in which purpura had been induced by such restriction, and alluded to certain experiments instituted by Magendie on dogs, in which impaired nutrition was induced by a like plan. At one time, scurvy, so common among mariners, was supposed to be dependent upon the use of highly salted meat used on long voyages;—the idea being, that there was something in the salted meat which acted as a cause; whereas the evil was produced by the exclusive use of one kind of diet by those who had been accustomed to both. This was prevented by the liberal allowance of lime-juice—an article exclusively vegetable in its character, so that scurvy is now a rare occurrence, as has been sufficiently proved during the long winters passed by the various arctic navigators.

The indications of treatment, the professor remarked, were clear,—to compel the patient to take animal food along with the vegetable, to prescribe tonics, and in short in every way to remove the oligæmia, by furnishing appropriate aliment, and arousing the nutritive functions to a more energetic action.

In scurvy, the primary changes are referred by Lind[2] "to a relaxation of the tone of the animal fibres, a weakening of the powers of digestion, together with a stoppage of perspiration, the tendency of which he admits was to produce spontaneous putrefaction, the process of nutrition being suspended."

Among the cases of purpura reported and published by Bateman, Willan, and Plumbe, there is one reported by Bateman[3] that came on during an accidental salivation from a few grains of mercury, which terminated fatally. In the thirteen cases published by Plumbe,[4] twelve were treated with mercurial purgatives, combined with jalap, or the extract of colocynth.; three of which terminated fatally, the others promptly recovering. The thirteenth case was treated upon Willan's plan, strictly followed out, tonics and good living, but terminated fatally.

There is no regular time as to the termination of purpura; its duration may be from three weeks to twelve months or more. As respects the various and conflicting treatments recommended for its cure, it may be remarked, that very little reliance can be placed upon any one alone; attention must be paid to its cause or pathology.

W. H. McKee.

[1] Plumbe on Diseases of the Skin. Bateman's synopsis, 3d edition. Willan on Cutaneous Diseases.

[2] Lind on Scurvy, p. 234.

[3] Bateman's Synopsis.

[4] Plumbe on Diseases of the Skin.

Art. IV.—ON THE PRESERVATION OF SUBJECTS FOR ANATOMICAL PURPOSES.

BY B. G. BABINGTON, M. D., AND G. O. REES, M. D.[1]

The difficulty which has existed in supplying the medical schools of London with subjects for dissection has made it an object of much importance, to discover a method by which human bodies may be preserved from putrefaction. This matter was more particularly brought to our notice last winter, when great inconvenience was felt by the students, not only of Guy's Hospital, but of every school in London, from the insufficient supply of subjects for dissection.

There are, it is true, many methods now in use of preserving animal matter; and the processes of tanning, salting, pickling, drying, smoking, freezing, are so many familiar examples of those methods; but they are all more or less inapplicable to the purposes of anatomical science: thus, tanning, smoking, and salting, wholly alter the appearance and texture of parts; the corrosive action of acids is injurious to the instruments employed in dissection; and immersion in ice, which might possibly be practised, under favourable circumstances, in preserving whole subjects, would, independently of its expense and inconvenience, fail of its effect, when once the student had begun his work. The only antiseptic which is free from the foregoing objections is a solution of alcohol. This, it must be admitted, answers well for museum preparations; but its powers are limited, and its injection into the blood vessels, even in its most concentrated form, will not materially retard decomposition: moreover, it destroys colour; and when employed in sufficient quantity to admit of the immersion of parts, is too costly for common use.

Some simple experiments of a purely practical nature, which we were induced to institute in consequence of the foregoing considerations, have led to a discovery, the application of which promises to remove one great obstacle to the study of a most important branch of medical education. Our attention was first directed to those chemical substances which were known to coagulate the blood; and we accordingly prepared strong solutions of the following metallic salts, viz. sulphate of zinc, sulphate of iron and diacetate of lead. We purposely stopped short of the point of saturation, from a belief that the great density of the fluid, in the case of salts so soluble, would impede its flow on injection. Infusion of galls was also adopted, from its powerful action in precipitating animal matters; and sugar, in the form of syrup, being well known to possess preservative qualities, we thought it worth while to make trial of its capabilities. With each of these fluids a rabbit was injected, from the aorta; and another rabbit, killed at the same time as those which were made the subject of experiment, was kept, for the sake of comparison. They were all exposed to the air, in an open court: being merely protected from the weather by enclosure in a wicker-basket, loosely covered with oil-cloth. At the end of three weeks, they had become putrid; and we could not perceive that, in any one instance, decomposition had been materially arrested. We were aware that arsenic and the bichloride of mercury both possessed considerable antiseptic powers. A solution of the former had indeed been tried with success at Guy's Hospital, in the previous year; but the poisonous qualities of these substances rendered them, in our opinion, as well as in that of others more nearly interested in their employment, decidedly objectionable.

The total failure of our attempts had nearly discouraged us from proceeding further, when it occurred to us that the preservative powers which exist in certain hydrocarbonous fluids offered some probability that they might be turned to account in the prosecution of our object. Creosote and pyroxylic spirit more especially attracted our attention; and as the former was too

[1] Guy's Hospital Reports, No. IX. Oct. 1839, p. 442.

expensive to admit of its being advantageously used alone, we combined it with thrice its bulk of solution of gum-arabic. Two rabbits were injected; the one with pyroxylic spirit, the other with this mixture; and exposed to air, with protection from the weather, precisely in the same manner as was practised in the former experiments. At the end of two months, from the 30th of November, when the injection was performed, these rabbits were examined at Guy's Hospital, and declared, by all who saw them opened, to be as perfectly free from putridity and as fit for all the purposes of dissection as on the day when they were killed. It should be stated, that in these instances, as well as in the experiment with infusion of galls, a portion of fluid was injected *per anum*.

Having thus far perfectly succeeded, we resolved to obtain permission from the hospital authorities to make a direct experiment on the human subject, as soon as the weather became warm enough to test our method with sufficient severity. In the course of the spring, we were permitted to avail ourselves of the following opportunity.

On the 15th of May last, a convict at Woolwich, 23 years of age, died of inflammation of the bowels; and, on the 18th, his body was sent, by order of the Inspector of Anatomy, to Guy's Hospital, for dissection. It was neither œdematous, nor in a state of decomposition; and although the integument was somewhat fat, it was, upon the whole, in a fair condition for anatomical purposes. On the 21st, a gallon of pyroxylic spirit was injected into the aorta; and the body was placed in a water-tight shell, or trough, made of slate, and loosely covered with a wooden lid. This trough was deposited in a cellar, the stone floor of which was about two feet below the surface of the ground. On the 29th, the lid was removed, for the first time, and the body was found to be perfectly fresh. On this occasion, the flesh of the extremities was remarked to have become somewhat firmer than when the injection was first made. From the 29th of May to the 12th of June, the subject was examined, by removing the lid of the trough every two or three days; and no change was perceptible until the latter date. At that time, the only sign of alteration was the appearance of two or three brown streaks—evidently veins—on the inside of the thighs; and a separation of the cuticle of the hands from the true skin, which began to assume a greenish hue. Every other part of the body was perfectly preserved, and of natural colour. There was no putrid odour on opening the lid of the trough, but the characteristic smell of the pyroxylic spirit was in some measure passing off. An incision into the middle of the right thigh, such as would be made in operating for popliteal aneurism, showed that the fat, muscles, blood vessels and nerves were in a complete state of preservation. It should be observed, that ever since the injection of the the subject the weather had been that of established summer; and that a second body, received from Woolwich, was so decomposed in three days after its arrival as to be totally unfit for dissection. On the last examination, as well as on two or three previous occasions, fluid was observed to occupy the bottom of the trough, and this it was thought advisable to remove: it was likewise determined to throw another quart of pyroxylic spirit into the aorta.

On the 24th of June, the body was removed to the dissecting-room, and placed on the table, for the purpose of being thoroughly dissected. With the exception of a greenish appearance on the outer part of the left thigh, and the brown streaks already mentioned, it appeared, when brought into the light, perfectly preserved. The skin on the back of the hands, instead of putrifying, had dried and become transparent; while the greenness of the left thigh proved, on incision, to be quite superficial. The dissection was undertaken by eight gentlemen, and completed by the 13th of July; and it is testified by them all, that every anatomical purpose was as fully answered as if the subject had been quite recent. The various parts, on being laid open, were of natural colour and of firm texture. The tendons and ligaments were silvery and white, and the nerves had lost none of their tenacity.

The pectoral muscles alone formed an exception to the natural colour which was elsewhere maintained: this appeared to be attributable to the macerating effects of a wetted cloth that had been laid upon the breast, to prevent evaporation through the aperture by which the injection had been accomplished. The parts which were exposed by dissection gradually dried; changing, in the course of a day or two, to a dark colour, and, instead of putrefying, becoming hard. The brain, although it had retained its form, was soft, semi-putrid and unfit for demonstration: it must be borne in mind, however, that had the head been opened six days after death—at which period the subject was injected—this probably would have been the case. With the above exception, the viscera were all perfectly preserved: in proof of which, one of the kidneys, appearing, in colour and consistence, quite recent, was removed in the beginning of July, and, after maceration, in warm water, in the usual manner, was injected with wax. This experiment was made in order to ascertain whether the spirit produced thickening, or any other alteration, in the inner coat of the blood vessels; which was found not to be the case, as the wax had fully penetrated the tissues of the organ.

Of the gentlemen engaged in the dissection of this subject, one complained that he at first suffered headach from the odour which it exhaled; and some, who were not so engaged, considered this to be more disagreeable than that of putridity. The same opinion is sometimes expressed with respect to the odour of parts that have been macerated in spirit of wine. Some allowance in favour of the pyroxylic spirit should be made on the score of novelty; and since its vapour is not poisonous nor injurious, any more than that of spirit of wine, it is to be presumed that the student would soon become accustomed and reconciled to it. In a first trial, upon the human subject, of the antiseptic powers of this fluid, a natural desire existed, on our parts, of watching its progress, and of noting such changes as might gradually occur. This led to the necessity of opening frequently the lid of the trough: and it has already been remarked, that this by no means accurately fitted the trough itself. The pyroxylic spirit being of a very volatile nature, it is obvious that its preservative qualities were much diminished by this proceeding. It is, therefore, not too much to expect that in an air-tight vessel a subject thus prepared would not exhibit even those superficial changes which took place in this instance, and would be preserved for an indefinite period.

The advantages of employing pyroxylic spirit are, 1st, its extreme fluidity, in consequence of which it may be thrown into the minutest vessels. 2dly, its freedom from colour. 3dly, its cheapness; for a gallon is sufficient to inject a full-sized subject: and even with the present limited manufacture of it, it is only half the price of alcohol; while it possesses infinitely greater antiseptic powers, and is, in common with that fluid, miscible with water, in all proportions. 4thly, its innocuous nature, and its freedom from any corrosive action upon steel instruments. We are not aware that there is any material disadvantage in its employment: the odour, it must be admitted, is more or less disagreeable to different individuals, but not so much so, to the generality of persons, as that of the putridity which it serves to prevent. Of this fluid, which must not be confounded with pyro-ligneous acid, or with pyro-acetic spirit, a full account may be found in the "Annals of Philosophy," N. S. viii. 69. That which we employed was procured from Morson's, in Southampton Row; and it may be had from any operative chemist.

BIBLIOGRAPHICAL NOTICES.

Dr. Pancoast's[1] and Dr. Dunglison's[2] Introductory Lectures.

Of the latter of these lectures we are obviously prevented from speaking, farther than to mention its objects, which were, mainly, to inculcate the importance of studying the principles of the science in an appropriate manner; and to encourage the student at the commencement of his attendance upon lectures.

Nor do we feel entirely unembarrassed in expressing our sentiments of Professor Pancoast's discourse,—standing, as we do, in the relation of one of his colleagues. It might be presumed, indeed, by those who are apt to ascribe improper motives to encomiums passed under such circumstances, that they were matters of course. We have, however, endeavoured, on all occasions to speak of the productions of authors as they deserve; and although we may unconsciously have been biased by amicable feelings to estimate perhaps too highly the productions of friends, we feel quite certain that no circumstances have ever induced us to depreciate the labours of those who have been personally unknown to us.

The introductory—initiatory—discourse of Dr. Pancoast is what such a discourse ought to be: dignified, but modest; indicating the ample qualifications of the Professor of surgery; and an earnest of the entire satisfaction which he has since given and is still giving, to one of the most attentive classes of students that have ever been within the walls of any institution.

Dr. Warrington's Nurse's Guide.[3]

This is an unpretending little volume, written with philanthropic views by one whose attention has been largely directed to the subject, and who is fully competent to the duty. Dr. Warrington is not unknown to our readers. We have more than once had occasion to refer to his contributions to obstetrics, and to the zeal and energy which he displays as a teacher and investigator of his favourite branch; and we cannot doubt, that if he can prevail on those for whose perusal the work before us is especially intended, to study it, he will render an essential service by enlightening those whose unskilful acts are often followed by most serious consequences.

[1] A Lecture Introductory to the Course of Surgery in the Jefferson Medical College, of Philadelphia, for the Session of 1839–40. By Joseph Pancoast, M. D., Professor of the Institutes of Surgery in Jefferson Medical College, one of the Surgeons to the Philadelphia Hospital, one of the Physicians to the Institution for the Deaf and Dumb, Fellow of the College of Physicians, &c. &c., published by the Members of the Class. 8vo, pp. 16. Philad., 1839.

[2] Introductory Lecture to the Course of Institutes of Medicine and Materia Medica, in Jefferson Medical College, of Philadelphia, for the Session of 1839–40. By Professor Dunglison. (Published by the Members of the Class.) 8vo, pp. 20. Philadelphia, 1839.

[3] The Nurse's Guide, containing a series of instructions to females who wish to engage in the important business of nursing mother and child in the lying-in chamber. By J. Warrington, M. D., Lecturer in Practical Obstetrics, Accoucheur to the Philadelphia Dispensary, and Philadelphia Nurse Charity, &c. &c. 12mo, pp. 131. Philadelphia, 1839.

MISCELLANEOUS NOTICES.

On the Medical Use of Alum in Diseases of the Heart. By Dr. Schlesier.—In this short paper, Dr. Schlesier calls attention to the great benefit derived from the internal use of alum in dyspepsia, and also and especially in dilatation of the heart. He quotes the case of a girl, aged 10, whose heart was so much dilated, that her case had been considered hopeless; but whom he succeeded in curing by the prolonged exhibition of alum. The stroke of the heart was perceptible over all the left side to the fourth false rib, and its motion appeared to the eye in the intercostal spaces like a rolling wave. The sternum and ribs of the left side were drawn upwards; the respiration was short and hurried, and accompanied by a short dry cough, and considerable dyspnœa; the pulse was about 100, soft and small, and the child was emaciated and pale. In this state alum was ordered, in combination with rhatany and digitalis, and its effects were truly wonderful. The apex of the heart became weekly more elevated, and the stroke of the heart more limited in extent, whilst the general condition of the patient improved so much that in four weeks she could be removed home. The treatment was continued for a considerable time with great benefit; but still a slight degree of dilatation remained, and the heart was easily affected by exercise and mental emotions.

[The auscultatory diagnosis of the disease ought to have been given, as also the dose of the remedy.]—*Medicinishe Zeitung*, No. xlvii. 1838.[1]

Clinical Experiments on the Emetic and Sudorific Properties of the Hydrated Sulphuret of Antimony, with excess of Sulphur. (Berzelius.) By M. A. Toulmouche, M. D.—From a series of experiments, of which the individual results are given in a table, M. Toulmouche draws the following conclusion on the properties of this salt.

1. This preparation of antimony acts with greater certainty as an emetic, when given in doses of one or two grains, than when exhibted in larger quantities.
2. It induces vomiting in smaller doses than kermes.
3. Its emetic action, although less uncertain than that of kermes, is still far from sure, inasmuch as it is only developed in somewhat more than half the cases of its administration.
4. It acts much less frequently as a purgative than as an emetic; whereas the contrary is true of kermes.
5. Like the last-named compound, it may be given with impunity in large doses, and in other affections besides rheumatism and pneumonia; in these cases its emetic and purgative effects appear to diminish in proportion to the increase of the dose.
6. The sudorific properties attributed to it by writers on materia medica are by no means incontestable; in 102 cases of its exhibition it acted on the skin thirteen times only.—*Gazette Médicale de Paris*, No. xiv. Avril, 1839.[2]

Statistics of Tracheotomy.—Since the introduction of tracheotomy in croupal affections into France, there has, doubtless, been reason to deplore a great number of failures; it may be presumed, however, that one of the chief reasons of its insufficiency depends on the delay and the obstacles that are generally thrown in the way of its performance. The following are the results which the different most celebrated operators have by their own

[1] Brit. and For. Med. Review, Oct. 1839, p. 556. [2] Ibid. p. 557.

declarations, in a late discussion at the Royal Academy of Medicine in Paris, obtained.

	Operations.	Cures.	Deaths.
M. Amussat, . . .	6	0	6
Baudelocque, . . .	15	0	15
Blandin, ...	5	0	5
Brettonneau, . .	18	4	14
Gerdy, . . .	6	4	2
Roux, ...	4	0	4
Trousseau, . . .	80	20	60
Velpeau, . . .	6	0	6
	140	28	112

So that, of 140 patients operated on, 28 only have been cured, and 112 have died.—*Journal des Connais. Méd.* Juin, 1839.[1]

On the Superiority of M. Reynaud's Operation for Circocele. By M. Jules Roux, M. D.—M. Reynaud takes, with both his hands, the spermatic cord of the diseased side; he isolates and pushes inwards towards the root of the penis the vas deferens, whose hardness distinguishes it from the vessels and nerves of the testicle; pinching then the scrotum with the fore-finger and thumb of the left hand, so as to embrace the spermatic vessels and nerves, he passes through the base of the fold thus formed, a curved needle, with waxed thread. The scrotum then let go, there remains, between the entrance and exit of the needle, an interval of about an inch; upon this interval is placed a thick cylinder of lint, but not very long; and the two ends of the ligature brought together over it, and tied by a *bow-knot*, so as to admit of untying or relaxing, should it become necessary, to diminish its pressure. Small pledgets, with cerate, are put upon the punctures: no bandage is necessary to keep them, but a simple compress is placed over all. The patient remains in bed, with the scrotum on a cushion, and is treated with diluents and lavements. A few days after, inflammation round the ligature takes place, ordinarily slight, and not preventing a tighter tie of the contained parts. If, however, the inflammation be violent, or the pain excessive, M. R. unties and slackens the ligature, reduces the inflammation, and again reties it; which occupies about two or three days' time. As the soft parts become divided, the ligature is tied again with more pressure. Towards the fifteenth or eighteeth day, the nerves and vessels of the testicle have been divided, and there remains only the skin to be cut. M. Reynaud now passes a directory in the line of the thread, and divides the skin with a bistoury. A simple wound succeeds to this incision, and quickly cicatrises; so that, in about twenty-five days from the commencement of the operation, the patient is ordinarily cured. Two cases have been successfully treated in this manner by M. Reynaud.[2]—*Journ. des Con. Méd.* No. V. Feb. 1829.

Case of Difficult Delivery of Twins which were united by the Breast. By the Berg-chirurgus Rath of Zellerfeld.[3] (*From the Archiv. der Harzer Chirurgen-Verein.*)—The patient was turned forty years of age; mother of several children. She had passed the first half of her pregnancy in perfect health: but during the last few weeks before labour, complained of constant cramps and much pain from the movements of the child. Shortly after the os uteri was dilated, the pains subsided; and although they were again excited by the ergot, they had no effect in forwarding the labour. The forceps was now applied, and the head brought down as far as the os

[1] Brit. and For. Med. Review, Oct. 1839, p. 558. [2] Ibid. p. 559. [3] Ibid. p. 568.

externum, but beyond this it was impossible to move it; and on further examination, a second head was found behind the first in the pelvic cavity. The patient was much exhausted, the abdomen tympanitic, very pendulous, and acutely painful; the external parts much swollen. A prolapsed umbilical cord was felt beating at the lower and posterior part of the vagina; but the patient had not felt any movement for some time. As there was no doubt that the first child was dead, and that it was an insurmountable obstacle to the delivery of the other, which might still be alive, and also increased the patient's danger, by protracting the labour, the head was separated from the body with some difficulty, owing to the closeness with which it was embraced by the external parts. It was effected by means of a gum-lancet, which the author considers to be an excellent instrument for the purpose. The second head could now be reached with the forceps, and was brought down as far as the chin and nape of the neck; but another obstacle now showed itself; after repeated examinations it was ascertained that the children were united by the breast, and that one had its back to the pubes, the other to the sacrum. The author endeavoured to give them such a direction that they should be in the longest diameter of the pelvis, by which means he succeeded in bringing them down as far as the shoulders. Having carefully disengaged the arms, and turned the children again into the antero-posterior diameter, and having fixed a blunt hook upon the band which united them, he gave it to an assistant, and then, with a fore-finger in the axilla of each child, he completed the delivery. Considerable hemorrhage required the speedy removal of the placenta, and the uterus now contracted. The children (two girls) weighed 15 lbs.; they were 17 inches long. The part by which they were united was 9 inches long and 3 broad, and extended from the upper extremity of the sternum to the navel, into which one umbilical cord, which was common to both, entered. The diameter of the two children, when laid close together, was between 7 and 8 inches, from back to the other. One child had two thumbs on the right hand. The cord was 19 inches long, and unusually thick. After suffering some time from peritonitis, &c. the patient recovered.—*Siebold's Journal.* B. 17. Heft ii. 1838.

Morton's Crania Americana.

We are happy to announce the receipt from the author of a copy of this splendid work, to the expected appearance of which we have more than once referred. We shall notice it in our next number.

BOOKS RECEIVED.

From Dr. Oppenheim, of Hamburg.—Zeitschrift für die gesammte Medicin, u. s. w. Jun. Jul. August. 1839.

From the same.—Jornal da Sociedade das Sciencas Medicas de Lisboa, Janeiro, Fevereero, Marco, 1837.

From the same.—Relation de la Société de Médecine et d'Histoire naturelle en Moldavie, &c. Iassy.

From the same.—De Labio Leporino, &c. Auct. Carol. Rudolph. Caspar. Accedunt iv tabulæ ære excusæ. 4to, pp. 55. Gotting. 1837.

From the Author.—The Nurse's Guide, containing a series of instructions to females who wish to engage in the important business of nursing mother and child in the lying-in chamber. By J. Warrington, M. D., Lecturer on Practical Obstetrics, Accoucheur to the Philadelphia Dispensary and Philadelphia Nurse Charity, &c. &c. 12mo, pp. 131. Philad., 1839.

From the Publishers, Marsh, Capen, & Co., Boston.—The second volume of Dr. Gross's Pathological Anatomy. The first volume has not reached us.